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Novel type of isoprenoid membrane anchors: an investigation of binding properties with dipalmitoylphosphatidylcholine vesicles

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Abstract

Copyright © 2016 John Wiley & Sons, Ltd. In this work, we present a new type of amphiphilic membrane-anchoring agents that can be easily obtained by the Diels-Alder reaction between terpene myrcene and N-substituted maleimides. The interaction between the compounds and small unilamellar dipalmitoylphosphatidylcholine vesicles was investigated using infrared spectroscopy, microgravimetry, and turbidimetry. The ability of the compounds to embed in the phospholipid membrane was shown to be strongly dependent on the charge of their polar group. The insertion of the compounds studied into the lipid bilayer did not lead to disruption of the dipalmitoylphosphatidylcholine vesicles up to the highest tested drug to lipid molar ratio of 0.5 to 0.6. Low lipid solubilization ability of the compounds as well as their rigid nonplanar structure makes them an interesting alternative to the common membrane-anchoring structural motifs.

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Keywords

dipalmitoylphosphatidylcholine vesicles, membrane anchors, N-substituted maleimides, terpenoids

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